

REMARKS

Claims 1-8 and 15-17 are currently pending in the subject application. In this Amendment "B", Applicant has amended claims 1, 2, 3, 7, 8, 15 and 17. Applicant hereby respectfully requests reconsideration of the subject application.

In the Office action, the Examiner notified the Applicant that corrected drawings were required. In response to the Office action, the Applicant encloses herewith 9 replacement sheets for the drawings.

The Examiner has objected to the specification because of an inconsistency in the use of reference numerals. In particular, on page 16, the trunnion shaft has the reference numeral "54", while on page 14, the trunnion shaft has the reference numeral "44". In response, Applicant has amended page 14 of the specification to change "44" to "54".

The Examiner has objected to claim 3 for having a typographical error. Applicant has amended claim 3 to correct this error.

The Examiner rejected claims 1-8 and 15-17 under 35 U.S.C. §112, second paragraph as being indefinite for a number of instances of lack of antecedent basis. In response, Applicant has amended claims 1, 2, 3, 7, 8, 15 and 17 to have proper antecedent basis. Applicant submits that the amended claims meet the requirements of 35 U.S.C. §112, second paragraph and notice to that effect is hereby respectfully requested.

The Examiner has rejected claims 1-3, 5-8 and 15-17 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,244, 157 to Brundiek in view of U.S.

Patent No. 4,717,804 to Vendelin et al.; U.S. Patent No. 4,798,342 to Williams; and U.S. Patent Application No. 2004/0148078 to Nakano et al. The Examiner has further rejected claim 4 under 35 U.S.C. §103(a) as being unpatentable over the Brundiek patent, the Vendelin et al. patent, the Williams patent, the Nakano et al. patent and further in view of U.S. Patent No. 6,295,851 to Sjostrom. For at least the reasons set forth below, Applicant traverses these rejections.

The Brundiek patent discloses an air flow rolling mill for comminuting hard minerals, such as slag or cement. The mill has a grinding tray and compression rollers. The Brundiek patent discloses setting a gap between the grinding tray and the compression rollers as a function of vibration of the mill, which is measured by a sensor 67 (column 8, lines 59-64). The Brundiek patent does not disclose using displacement measurements of a roller assembly to calculate a diameter of one of the rollers, wear of one of the rollers, or a thickness of the mineral being crushed.

The Vendelin et al. patent discloses a cone crusher having three potentiometers or transducers 25 for measuring distance between a liner 19 and mantle 13. A desired gap between the liner 19 and mantle 13 is maintained by a hydraulic system controlled by a controller using the transducers 25 (column 6, lines 24-30). The Vendelin et al. patent discloses that: "*Other monitoring functions are also provided by the Controller, including measurement of wear on the mantle 13 and liner 19.*" (column 6, lines 43-45). Contrary to the Examiner's assertion, however, the Vendelin et al. patent does not disclose how the wear on the mantle is measured. Thus, it is clear that the Vendelin et al. patent does not disclose using displacement

measurements to measure wear of a mantle and liner in a cone crusher, let alone using displacement measurements of a roller assembly in a solid fuel pulverizing mill to calculate a diameter of a roller, wear of a roller, or a thickness of a solid fuel being crushed.

The Williams patent discloses a roller mill assembly controlled by a programmable computer. The Williams patent does not disclose (and is not cited as disclosing) using displacement measurements of a roller assembly in a solid fuel pulverizing mill to calculate a diameter of a roller, wear of a roller, or a thickness of a solid fuel being crushed.

The Nakano et al. patent discloses a vehicle steering apparatus having a control unit that provides information to a driver. The information may be obtained using power spectrum analysis of vibrations of the steering system, or tire and suspension system (paragraph 0151). The Nakano et al. patent does not disclose, (and is not cited as disclosing) using displacement measurements of a roller assembly in a solid fuel pulverizing mill to calculate a diameter of a roller, wear of a roller, or a thickness of a solid fuel being crushed.

The Sjostrom patent discloses a method of monitoring the distance between rolls of a roll pair in a (steel) rolling mill. The Sjostrom patent does not disclose, (and is not cited as disclosing) using displacement measurements of a roller assembly in a solid fuel pulverizing mill to calculate a diameter of a roller, wear of a roller, or a thickness of a solid fuel being crushed.

Initially, Applicant submits that the Nakano et al. patent is nonanalogous art and

should not be used as a reference pursuant to MPEP §2141.01(a). In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). The present invention is directed to a solid fuel pulverizing mill with a computing device, while the Nakano et al. patent is directed to a vehicle steering apparatus. Clearly, these are very different fields of endeavor, as is evidenced by the PTO classification of the present invention (Class 241: Solid Material Comminution or Disintegration) and the Nakano et al. patent (Class 701: Vehicle Control, Guidance, Operation, or Indication). The problem confronted by the Applicant is to "provide a hardware/software system that monitors coal mill operating condition, detects and predicts mill failure..... and estimates coal fineness of the pulverized coal in order to optimize the coal pulverizing process" (from the penultimate line of page 5 to line 3 on page 6 of the specification). In contrast the problem confronted by the Nakano et al. patent is to provide information about the operation of a vehicle to a driver of the vehicle. Thus, the problem confronted by the Nakano et al. patent is very different than the problem confronted by the Applicant. Accordingly, Applicant submits that pursuant to the holding in *In re Oetiker*, the Nakano et al. patent is nonanalogous art.

In rejecting the claims, the Examiner states "*it would have been obvious to one skilled in the art at the time the invention was made to modify Brundiek with a sensor for measuring displacement of the grinding gap in order in order to control the grinding*

*gap and determine wear, as taught by Vendelin*". Even if it is assumed that the Vendelin et al. patent discloses using measurement of a grinding gap to determine wear (which it doesn't) and even if the Examiner's proposed combination of the Brundiek patent and the Vendelin et al. patent is made, frequency analysis cannot be performed on a measurement of the grinding gap because it is non-oscillatory. Clearly, frequency analysis cannot be performed on a non-oscillatory measurement. Thus, a combination of the Brundiek patent and the Vendelin et al. patent, alone or in combination with the other references fails to disclose using *frequency power spectrum analysis* of displacement measurements of a roller assembly in a solid fuel pulverizing mill to calculate a diameter of a roller, wear of a roller, or a thickness of a solid fuel being crushed, as set forth above. Thus, the cited references do not show or suggest (with emphasis added):

*"a computing device operable to perform data collection and **frequency power spectrum analysis** of said displacement of said assembly **to determine: the diameter, D, of each of said one or more rollers**"* , as recited in amended independent claim 1;

*"a computing device operable to perform data collection and **frequency power spectrum analysis** of said displacement of said assembly **to determine a reduction and/or depth of wear cup, H, of each of said one or more rollers**"*, as recited in amended independent claim 7; and

*"a computing device operable to perform data collection and **frequency power spectrum analysis** of said displacement of said assembly **to determine a***

***relative thickness  $L_1$  of said solid fuel in said mill***", as recited in amended independent claim 8.

For at least this reason, the cited references fail to show or suggest independent claims 1, 7 and 8 and, thus, dependent claims 2-6 and 15-17.

With regard to the formulas recited in independent claims 1, 7 and 8, the Examiner stated that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to formulate a wear calculating algorithm with different variables and constants, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In *re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)". Applicant submits that the cited rule from *In re Boesch* is inapplicable and cannot be used to summarily reject the recited formulas. The rule set forth in *In re Boesch* is applicable to chemical compounds that differ from prior art chemical compounds only in the relative proportions of the constituent components (variables), i.e., there is only a difference in component (variable) proportions or ranges. In fact, in the *In re Boesch* case, the ranges of constituents in a claimed nickel base alloy overlapped ranges disclosed in prior art references. The subject matter of the pending claims is not a chemical compound, or a chemical process. Moreover, the formulas recited in independent claims have nothing to do with finding an optimum value of a result effective variable. The formulas define relationships between variables, which relationships are not shown or even remotely suggested by the cited references. For this additional reason, the cited references fail to show or suggest independent claims 1, 7 and 8 and, thus,

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dependent claims 2-6 and 15-17.

Based on the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 050877.

Respectfully submitted,

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